

## HIGH SCHOOL MATHEMATICS COURSE CODES GRADES 9-12

Course Code	Course Name	Grade Levels	Description	High School Credit Options*	License/credential Required**
11010	Title I Remedial Mathematics	9-12	Sets numeration, operations and properties, mathematical sentences, geometry, measurement, graphing and functions, and probability and statistics.	Supplemental instruction – provided as needed	License Code: 11010-Mathematics ♦ 7-12 or 9-12 <b>AND</b> 7-12 Math Credential
11029	Mathematics Intervention	9-12	Mathematics Intervention is designed to assist students who are struggling and/or failing in a mathematics course. This course should be provided in conjunction with the regular mathematics course to pre-teach, re-teach, or provide enrichment to the student in order to prevent the need to modify the school's existing mathematics curriculum. This course should be a structured class period which will build upon the existing mathematics skills needed for students to achieve the opportunity for success in their current and/or future mathematics courses.	$\frac{1}{2}$ or 1  <i>Max credit = 3</i>	License Code: 11010–Mathematics ♦ 7-12 or 9-12
11030	Prealgebra	9-12	Prealgebra increases students' foundational math skills and prepare them for Algebra I by covering a variety of topics, such as properties of rational numbers (i.e., number theory), ratio, proportion, estimation, exponents and radicals, the rectangular coordinate system, sets and logic, formulas, and solving first-degree equations and inequalities.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11031	Algebra I	8 (see note)  9-12	Algebra I includes the study of properties and operations of the real number system; evaluating rational algebraic expressions; solving and graphing first degree equations and inequalities; translating word problems into equations; operations with and factoring of polynomials; and solving simple quadratic equations.  <b><i>NOTE: Use this course when credit is awarded for the full school year. This course code <u>should only be used</u> for MIS03 reporting purposes when a grade 8 student <u>is</u> receiving high school credit.</i></b>	1  <i>Max credit = 1</i>	
11035	Algebra I Semester 1	8 (see note)  9-12	The first part in a multi-part sequence of Algebra I. This course generally covers the same topics as the first semester of Algebra I, including the study of properties of rational numbers (i.e., number theory), ratio, proportion, and estimation, exponents and radicals, the rectangular coordinate system, sets and logic, formulas, and solving first degree equations and inequalities.  <b><i>NOTE: This course code <u>should only be used</u> for MIS03 reporting purposes when a grade 8 student <u>is</u> receiving high school credit.</i></b>	$\frac{1}{2}$  <i>Max credit = <math>\frac{1}{2}</math></i>	

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11036	Algebra I Semester 2	8 (see note)  9-12	<p>The second part in a multi-part sequence of Algebra I. This course generally covers the same topics as the second semester of Algebra I, including the study of properties of the real number system and operations, evaluating rational algebraic expressions, solving and graphing first degree equations and inequalities, translating word problems into equations, operations with and factoring of polynomials, and solving simple quadratics.</p> <p><b><i>NOTE: This course code <u>should only be used</u> for MIS03 reporting purposes when a grade 8 student <u>is receiving high school credit</u>.</i></b></p>	$\frac{1}{2}$  <i>Max credit = <math>\frac{1}{2}</math></i>	License Code: 11010—Mathematics ♦ 7-12 or 9-12
11032	Algebra II  ♦ Prerequisite: Algebra I - 11031	9-12	Algebra II topics typically include field properties and theorems; set theory; operations with rational and irrational expressions; factoring of rational expressions; in-depth study of linear equations and inequalities; quadratic equations; solving systems of linear and quadratic equations; graphing of constant, linear, and quadratic equations; properties of higher degree equations; and operations with rational and irrational exponents. The course may introduce topics in discrete math, elementary probability and statistics; matrices and determinants; and sequences and series.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11037	Linear Algebra  ♦ Prerequisite: Algebra II - 11032	11-12	Linear Algebra includes a study of matrices, vectors, tensors, and linear transformations and is typically intended for students who have attained pre-calculus objectives.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11038	Linear Programming  ♦ Prerequisite: Algebra II - 11032	11-12	Linear Programming includes a study of mathematical modeling and the simplex method to solve linear inequalities and is typically intended for students who have attained pre-calculus objectives.	$\frac{1}{2}$  <i>Max credit = <math>\frac{1}{2}</math></i>	
11039	Abstract Algebra  ♦ Prerequisite: Algebra II - 11032	11-12	Abstract Algebra includes a study of the properties of the number system from an abstract perspective, including such topics as number fields (i.e., rational, real, and complex numbers), integral domains, rings, groups, polynomials, and the fundamental theorem of algebra. Abstract Algebra is typically geared towards students who have attained pre-calculus objectives.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	

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11033	Discrete Mathematics  ♦ Prerequisite: Algebra II - 11032	11-12	Discrete Mathematics includes the study of topics such as number theory, discrete probability, set theory, symbolic logic, Boolean algebra, combinatorics, recursion, basic algebraic structures and graph theory.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	License Code: 11010—Mathematics ♦ 7-12 or 9-12
11034	College Algebra  ♦ Prerequisite: Algebra II - 11032	11-12	Covering topics from both Algebra and Analytic Geometry, this course prepares students for eventual work in calculus. Topics include the study of polynomial, logarithmic, exponential, and rational functions and their graphs; vectors; set theory; Boolean algebra and symbolic logic; mathematical induction; matrix algebra; sequences and series; and limits and continuity; the polar coordinate system; equations and graphs of conic sections; rotations and transformations; and parametric equations.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11051	Integrated Mathematics I	9-12	This course formalizes and extends middle school mathematics, deepening students' understanding of linear relationships. The course begins with a review of relationships between quantities, building from unit conversion to a study of expressions, equations, and inequalities. Students contrast linear and exponential relationships, including a study of sequences, as well as applications such as growth and decay. Students review one-, two-, and multi-step equations, formally reasoning about each step using properties of equality. Students extend this reasoning to systems of linear equations. Students use descriptive statistics to analyze data before turning their attention to transformations and the relationship between Algebra and Geometry on the coordinate plane.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11052	Integrated Mathematics II  ♦ Prerequisite: Integrated Mathematics I - 11051 or Algebra I - 11031	9-12	This course begins with a brief exploration of radicals and polynomials before delving into quadratic expressions, equations, and functions, including a derivation of the quadratic formula. Students then embark on a deep study of the applications of probability and develop advanced reasoning skills with a study of similarity, congruence, and proofs of mathematical theorems. Students explore right triangles with an introduction to right triangle trigonometry before turning their attention into the geometry of circles and making informal arguments to derive formulas for the volumes of various solids.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	

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11053	Integrated Mathematics III  ♦ Prerequisite: Integrated Mathematics II - 11052 <b>or</b> Algebra I - 11031 <b>and</b> Geometry -11120	9-12	This course synthesizes previous mathematical learning in four focused areas of instruction. First, students relate visual displays and summary statistics to various types of data and to probability distributions with a focus on drawing conclusions from the data. Then, students embark on an in-depth study of polynomial, rational, and radical functions, drawing on concepts of integers and number properties to understand polynomial operations and the combination of functions through operations. This section of instruction builds to the Fundamental Theorem of Algebra. Students then expand the study of right triangle trigonometry they began in Mathematics II to include non-right triangles and developing the Laws of Sines and Cosines. Finally, students model an array of real-world situations with all the types of functions they have studied, including work with logarithms to solve exponential equations. As they synthesize and generalize what they have learned about a variety of function families, students appreciate the usefulness and relevance of mathematics in the real world.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	License Code: 11010–Mathematics ♦ 7-12 or 9-12
11061	Calculus  ♦ Prerequisite: Precalculus - 11181 <b>or</b> Algebra II - 11032 <b>and</b> Trigonometry - 11160 <b>and</b> Geometry - 11120 <b>or</b> Trigonometry/ Analytic Geometry - 11161	11-12	Calculus includes the study of derivatives, differentiation, integration, the definite and indefinite integral, and applications of calculus. Typically, students have previously attained knowledge of pre-calculus topics (some combination of trigonometry, elementary functions, analytic geometry, and algebra).	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	

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11111	General Mathematics I	9-12	General Math reinforces and expands students' foundational math skills, such as arithmetic operations using rational numbers; area, perimeter, and volume of geometric figures, congruence and similarity, angle relationships, the Pythagorean theorem, the rectangular coordinate system, sets and logic, ratio and proportion, estimation, formulas, solving and graphing simple equations and inequalities.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	License Code: 11010–Mathematics ♦ 7-12 or 9-12
11118	College Learning Lab – Math 12	12	College Learning Lab-Math focuses on preparing the student for collegiate studies, specifically to mathematics. The student will be engaged in educational experiences regarding mathematical methods for solving equations and word problems. The course will refresh students regarding equations, number systems, algebra, geometry, ratio, and analytical reasoning.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
11119	Applied Geometry	9-12	Students will understand the basic facts and properties about points, lines, planes, parallel and perpendicular lines, triangles, polygons (with emphasis on quadrilaterals), circles, and three dimensional figures. Problem solving will involve the use of formulas, such as distance, midpoint, slope, area, volume, the Pythagorean Theorem, and trigonometric ratios. Emphasis will be on connecting geometry to real-world situations to solve problems, especially related to algebra, everyday life, navigation, architecture and art. Concepts will be studied using tools which may include the ruler, compass, protractor, calculator, and geometric software.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
11120	Geometry	9-12	Geometry, emphasizing an abstract, formal approach to the study of geometry, typically includes topics such as properties of plane and solid figures; deductive methods of reasoning and use of logic; geometry as an axiomatic system including the study of postulates, theorems, and formal proofs; concepts of congruence, similarity, parallelism, perpendicularity, and proportion; and rules of angle measurement in triangles.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	
11121	Analytic Geometry ♦ Prerequisite: Algebra II - 11032, <b>and</b> Geometry 11120	11-12	Analytic Geometry courses include the study of the nature and intersection of lines and planes in space, including vectors, the polar coordinate system, equations and graphs of conic sections, rotations and transformations, and parametric equations.	$\frac{1}{2}$ or 1 <i>Max credit = 1</i>	

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11145	Consumer Mathematics	9-12	Consumer Math reinforces general math topics (such as arithmetic using rational numbers, measurement, ratio and proportion, and basic statistics) and applies these skills to consumer problems and situations. Applications typically include budgeting, taxation, credit, banking services, insurance, buying and selling products and services, home and/or car ownership and rental, managing personal income, and investment.	$\frac{1}{2}$ or 1  Max credit = 1	License Code: 11010—Mathematics ♦ 7-12 or 9-12
11150	Probability and Statistics  ♦ Prerequisite: Algebra II - 11032	11-12	Probability and Statistics introduces the study of likely events and the analysis, interpretation, and presentation of quantitative data. Course topics generally include basic probability and statistics: discrete probability theory, odds and probabilities, probability trees, populations and samples, frequency tables, measures of central tendency, and presentation of data (including graphs). Course topics may also include normal distribution and measures of variability.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11160	Trigonometry  ♦ Prerequisite: Geometry 11120 <b>and</b> Algebra II - 11032	10-12	Trigonometry prepares students for eventual work in calculus and typically includes the following topics: trigonometric and circular functions; their inverses and graphs; relations among the parts of a triangle; trigonometric identities and equations; solutions of right and oblique triangles; and complex numbers.	$\frac{1}{4}$ , $\frac{1}{2}$ , or 1  <i>Max credit = 1</i>	
11161	Trigonometry/ Analytic Geometry  •Prerequisite: Geometry- 11120 <b>and</b> Algebra II- 11032	11-12	Covering topics of both Trigonometry and Analytic Geometry, this course prepares students for eventual work in calculus. Topics typically include the study of right trigonometric and circular functions, inverses, and graphs; trigonometric identities and equations; solutions of right and oblique triangles; complex numbers; numerical tables; vectors; the polar coordinate system; equations and graphs of conic sections; rotations and transformations; and parametric equations.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11162	Geometry/ Trigonometry/ Advanced Algebra  •Prerequisite: Geometry- 11120 <b>and</b> Algebra I- 11031	11-12	Geometry/Trigonometry/Advanced Algebra reviews and extends algebra and geometry concepts for students who have already taken Algebra I and Geometry. This course includes a review of such topics as properties and operations of real numbers; evaluation of rational algebraic expressions; solutions and graphs of first degree equations and inequalities; translation of word problems into equations; operations with and factoring of polynomials; simple quadratics; properties of plane and solid figures; rules of congruence and similarity; coordinate geometry including lines, segments, and circles in the coordinate plane; and angle measurement in triangles including trigonometric ratios.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	

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11170	STEM Seminar (Math)	9-12	<p>STEM Seminar provides students with a project based and integrated and holistic experience with Science Technology Engineering and Math. Taught by an interdisciplinary team of teachers, the course demonstrates the blurring of content areas when solving an authentic problem. It focuses on engaging students in hands on interdisciplinary application of the Engineering Design Process. Students engage in authentic projects and create products, presentations, and network with local STEM industry experts. In this course students uncover and acquire a cohesive set of concepts, competencies, and dispositions of science, technology, engineering, and mathematics that they transfer and apply in both academic and real-world contexts in order to be globally competitive in the 21<sup>st</sup> Century. This course curriculum infuses academic content from Math, Science, Language Arts, and Social Studies. It utilizes state and common core standards, technical skills and develops 21<sup>st</sup> Century Skills such as communication, networking, collaboration, decision making, creativity and critical thinking.</p> <p><b>Note: This course can be taught for Mathematics credit only. For Technology and Engineering credit, use STEM Seminar (Tech Ed) under Technology and Engineering. For Science credit, use STEM Seminar (Science) under Science.</b></p>	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	License Code: 11010–Mathematics ♦ 7-12 or 9-12
11181	Precalculus  ♦ Prerequisite: Algebra II - 11032, and Geometry 11120 <b>OR</b> Geometry/ Trigonometry/ Advanced Algebra - 11162	11-12	Precalculus combines the study of Trigonometry, Elementary Functions, Analytic Geometry, and Algebra topics as preparation for calculus. Topics typically include the study of complex numbers; polynomial, logarithmic, exponential, rational, right trigonometric, and circular functions, and their relations, inverses and graphs; trigonometric identities and equations; solutions of right and oblique triangles; vectors; the polar coordinate system; conic sections; Boolean algebra and symbolic logic; mathematical induction; matrix algebra; sequences and series; and limits and continuity.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	

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11190	Applied Mathematics  ♦ Prerequisite: General Mathematics 11111	9-12	Applied Mathematics is designed to help students develop and refine job related math skills. Units focus on arithmetic operations, problem solving techniques, estimation of answers, measurement skills, algebra, geometry, data handling, statistics, and computers. Emphasis is on the ability to apply functional mathematics to solve problems in the world of work.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	License Code: 11010–Mathematics ♦ 7-12 or 9-12
11191	Occupationally Applied Math	9-12	Occupationally Applied Math reinforces general math skills, extend these skills to include some prealgebra and algebra topics, and use these skills primarily in occupational applications. Course topics typically include rational numbers, measurement, basic statistics, ratio and proportion, basic geometry, formulas, and simple equations.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11122	Informal Geometry	10-12	Informal Geometry emphasizes a practical approach to the study of geometry and deemphasizes an abstract, formal approach. Topics typically include properties of and work with plane and solid figures; inductive methods of reasoning and use of logic; concepts of congruence, similarity, parallelism, perpendicularity, and proportion; and rules of angle measurement in triangles.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11112	Particular Topics in Foundation Math	10-12	This course examines particular topics in Foundation Math, such as arithmetic or basic conceptual skills, rather than provide a general overview.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11580	Advanced Placement Statistics©	10-12	Following the College Board's suggested curriculum designed to parallel college-level statistics courses, AP Statistics introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, sampling and experimentation, anticipating patterns, and statistical inference.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	
11581	Advanced Placement Calculus AB©	10-12	Following the College Board's suggested curriculum designed to parallel college-level calculus courses, AP Calculus AB provides students with an intuitive understanding of the concepts of calculus and experience with its methods and applications. This course introduces calculus and include the following topics: elementary functions; properties of functions and their graphs; limits and continuity; differential calculus (including definition of the derivative, derivative formulas, theorems about derivatives, geometric applications, optimization problems, and rate-of-change problems); and integral calculus (including antiderivatives and the definite integral).	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	

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11582	Advanced Placement Calculus BC©	10-12	Following the College Board's suggested curriculum designed to parallel college-level calculus courses, AP Calculus BC provides students with an intuitive understanding of the concepts of calculus and experience with its methods and applications, and also require additional knowledge of the theoretical tools of calculus. This course assumes a thorough knowledge of elementary functions, and cover all of the calculus topics in AP Calculus AB as well as the following topics: vector functions, parametric equations, and polar coordinates; rigorous definitions of finite and nonexistent limits; derivatives of vector functions and parametrically defined functions; advanced techniques of integration and advanced applications of the definite integral; and sequences and series.	$\frac{1}{2}$ or 1  <i>Max credit = 1</i>	License Code: 11010–Mathematics ♦ 7-12 or 9-12

\* High school curricular requirements are spelled out in NDCC 15.1-21-02. Maximum credit refers to the maximum units of credit a student may earn for a course over four years of high school. (Example: Band - a student may be enrolled in band all four years of high school -- earning a possible total of four units of credit.)

\*\* Please refer to the second page of the teacher's North Dakota Educator's Professional license to verify which subject areas a teacher is qualified to teach. Licenses and endorsements are obtained on a teaching license from the Education Standards and Practices Board (ESPB). Credentials are obtained from the Department of Public Instruction (DPI) and are issued to individuals holding a current teaching license.